Evaluating the factor structure and psychometric properties of the Health-Related Masculine Values Scale in the context of Australian men's mental health

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This thesis is submitted in partial fulfilment of the Honours degree of Bachelor of Psychological Science

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October 2020

Word Count: 9, 334

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Abstract

To date, masculinity and men's health research has focused almost exclusively on the health-damaging effects of conformity to masculine ideals and standards. Given the disparity in health outcomes for men compared to women, it is important to determine what constitutes men's health-related values. The Health-Related Masculine Values Scale (HRMVS) is a measure designed to assess health-promoting ideas of masculinity. In a cross-sectional sample of Australian men (18 to 93 years, n = 898), confirmatory analyses supported an abbreviated eight-item, two factor model for the HRMVS (HRMVS-8) that was stable across younger (< 29 years), middle aged (30–64 years), and older men (≥ 65). The scale also demonstrated poor concurrent validity with a traditional measure of masculinity, and inadequate convergent validity with indicators of psychological distress and suicidality. Collectively, the results call into question the utility of the HRMVS-8 as a measure of positive, health-related masculine values.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

15/10/2020

Contribution statement

In writing this thesis, the internal and external supervisors provided access to an existing data set and specified key articles of interest. Initial research aims and questions were developed by myself and were later refined by the supervisors. An analytic strategy was collaboratively developed and JASP syntax for confirmatory factor analyses was provided by an external supervisor after attempts were made. The Method section was reviewed by a PhD candidate who collected the parent data.

Acknowledgements

To my external supervisor, thank you for your guidance and (realistic) advice, it's been a privilege to work with your pragmatic and fresh approach to research.

To my internal supervisor, thank you for your unwavering support and friendly catchups. It has been an honour to work with someone with your knowledge and expertise.

To the PhD candidate who allowed me to use their dataset, your willingness to share your work and experience has been invaluable – thank you.

To my family and friends, for putting up with me this year and listening to my ideas and theories, thank you for your patience and support.

Lastly, to the boys who could not be here — I hope that this project will show those who are still hanging on, their positive strengths.

Evaluating the factor structure and psychometric properties of the Health-Related Masculine Values Scale in the context of Australian men's mental health

Overview

There are two consistent arguments in masculinity and men's health research. First, the disparity in health outcomes in Western countries for men compared to women has led research to focus on the gendered nature of health, particularly mental health (Broom & Tovey, 2009). In Australia, men continuously dominate suicide statistics, accounting for 75% of total recorded deaths by suicide in 2018 (Australian Bureau of Statistics [ABS], 2019). This is particularly concerning given the leading cause of death for young males aged between 15 and 44 is suicide (ABS, 2019).

Second, empirical research has demonstrated that men's adherence to traditional masculine norms is associated with engaging in risk-taking behaviours such as heavy drinking, substance abuse and dangerous driving, and that men are less likely to engage in health-promoting behaviours such as seeking professional help (Connell, 1995; Courtenay, 2000; Broom & Tovey, 2009; Affleck, Carmichael & Whitley, 2018; Addis & Mahalik, 2003; Mahalik, Lagan & Morrison, 2006; Mahalik, Walker, & Levi-Minzi, 2007; Liu & Iwamoto, 2007). A recent Australian study indicated that self-reliance — a dominant masculine norm — was a significant predictor for risk of suicidal ideation among males (Pirkis, Spittal, Keogh & Mousaferiadis, 2017).

However, there has been limited quantitative research exploring what constitutes positive masculinities that might support men's health and wellbeing. Qualitative and mixed-methods research in the fields of chronic illness and ageing has demonstrated that endorsement of certain traditional and non-traditional masculinities can support positive and successful health behaviours among men (Smith, Braunack-Mayer, Wittert & Warin, 2007; Chambers, Hyde,

Oliffe et al., 2016). Some scholars have argued for an affirming strength-based approach to be adopted to address the gendered gap in mental health outcomes, specifically depression and suicidality, to advance men's health (Hammer & Good, 2010; Englar-Carlson & Kiselica, 2013; Seidler, Rice, River, Oliffe & Dhillon, 2018). However, there is a lack of quantitative measures of positive masculinities that can be applied to a broad range of health contexts.

Researchers have recently developed the Health-Related Masculine Values Scale (HRMVS; Oliffe, Rice, Kelly et al., 2019) to address the shortcomings of current tools in the pursuit to "capture the changing face of men's gendered lives" (Thompson & Bennet, 2015, p. 115, as cited in Oliffe et al., 2019). This scale aims to identify what constitutes masculinity in the lives of men in regard to their health and wellbeing (Oliffe et al., 2019). The scale was developed and tested among a sample of young Canadian men. Therefore, it is imperative to broaden the scope of the measure to assess concepts relating to strength-based masculinities that are not restricted by the parameters of age and locale. Rice and colleagues' (2020) quantitative investigation uncovered links between the HRMVS and a decreased risk of depression among North American men with a history of childhood maltreatment. The role of masculinity in either protecting against or heightening the risk of depression and suicidality among a population of men experiencing psychological distress, is of particular interest.

To assess the psychometric properties and utility of the HRMVS in the context of mental health, the intent of the current study is to address the validity of the instrument in an age-diverse sample of Australian men. The present study included confirmatory analyses to allow the most appropriate factor structure to be deduced. With this type approach, the HRMVS items were constrained to the three different theoretical models determined by previous empirical analyses (Oliffe et al., 2019; McCreary, Barron & Swami, 2019; Rice, Kealy, Ogrodniczuk, Black, Seidler & Oliffe, 2020). This study examines the psychometric properties of the scale,

specifically, the concurrent validity with a measure of traditional masculinity as well as the scale's convergent validity across indicators of psychological distress.

1.1 Masculinity terminology

Traditional masculinity refers to the hegemonic or dominant concept of what it means to 'be a man', a notion that is cultivated by societal norms and ideals (Levant, 1995; Pleck, 1995; Addis & Cohane, 2005). Hegemonic masculinities are both material and discursive idealised patterns of behaviour (Connell, 1995) and power relationships in culture (Pyke, 1996). In many western cultures, men are idealised to be self-reliant, strong and stoic rather than being overly concerned with health risk or injury (Courtenay, 2000). From qualitative and therapeutic discourse, it has been suggested that men embody a broader array of masculinities and that hegemonic masculinity does not entirely capture the lived experiences of men. There is general consensus that the concept is in need of reconstruction in order to effectively represent what constitutes men's masculine values, particularly those that guide their behaviours towards improved health and wellbeing.

A plethora of masculinity studies has sought to address the emergence of this new (Kaplan, Rosenmann & Shuhendler, 2017), inclusive (Anderson, 2009), caring (Elliot, 2015) and strength-based (Hammer & Good, 2010; Englar-Carlson & Kiselica, 2013) concept of masculinities. The concept of positive masculinity is used to describe the qualities of masculinity that are adaptive, non-traditional, and strength-based—ones that have the potential to support and improve men's health. However, there is a lack of consistent tools that describe and measure positive masculinities accurately in the context of men's health research.

By definition, masculine norms and ideals are a composed set of standards that govern men's behaviours, whereas values are culturally transmitted principles which guide men's beliefs (Rokeach, 2008). Health-related values and behaviours held by men can be viewed as

a means of demonstrating and maintaining masculinity (Courtenay, 2009). The conceptualisations outlined above will be used in the present study.

1.2 Masculinity theory

Previous studies of masculinity and men's health were dominated by sex role theory (Goldberg, 1976; Nathanson, 1977; Verbrugge, 1985). This model of socialisation considered males to be 'hardwired' to engage in risky health behaviours. In Harrison (1978) and later in Harrison, Chin & Ficarroto (1992), the authors warned 'the male sex role may be dangerous to your health' (p. 1). Sex role theory was widely criticised for considering gender to be "two-fixed, static and mutually exclusive role containers" (Kimmel, 1986, p. 521), and overlooked the multiplicity of feminine and masculine traits that characterise both men and women (Connell, 1995).

Social constructivism soon emerged, arguing that men and women behave in the way that they do because of the dominant concepts of femininity and masculinity in their culture, rather than their binary sex or psychological traits (Pleck, Sonenstein & Ku, 1994; Courtenay, 2009). The construction of femininity and masculinity moved away from two static categories and began to be seen in terms of social relationships that are fabricated through socialisation and reproduced by actions (Gerson & Peiss, 1985; Courtenay, 2009). Much qualitative research began to focus on the *plurality* of masculinities and how they fuel men's damaging health behaviours (Broom & Tovey, 2009). Early work by Courtenay (2000) demonstrated how the need to fulfil idealised notions of masculinity positions men to engage in risk-taking behaviours and to avoid engaging in behaviours that promote health and wellbeing. In this context, men's endorsement of masculinities can be understood as actions on a continuum, ranging from health-destructive to health-promoting (Oliffe et al., 2019; Courtenay, 2000). Social constructivist frameworks positioned men's conformity to hegemonic masculinity as a

significant barrier to health (Courtenay, 2000). Despite this, it is important to acknowledge that key insights from social constructivism are integral to the understanding of masculinities as plural constructs that are dependent on context and societal expectations.

Scholars then began to branch away from social constructivism and assert that masculinities per se could not be altogether detrimental for men's health (Robertson, 2007; Roberts, 2013; Anderson, 2009; Creighton & Oliffe, 2010; Griffith, 2012). It was acknowledged that understanding of men's health experiences was incomplete and more positive ideas of masculinities began to appear in literature to theoretically construct non-traditional masculinities. These were more caring and strengths-based and are hereafter referred to as positive masculinities. This new branch of research can be used to describe qualities of masculinity that could potentially be leveraged to improve men's lives and health outcomes (Englar-Carlson & Kiselica, 2013). O'Neil (2010) summarises here the possibilities of positive masculinity:

> Positive masculinity is about changing the dialogue to what men can strive for that transcends the sexist socialization they have experienced. Many men remain confused about who they are or who they should become in terms of gender roles. Therefore, positive-healthy masculinity can be a vehicle to mediate the essentialist and destructive stereotypes that cause much unnecessary suffering for men, women, and children. (p. 105)

Positive masculinity moves away from solely addressing apparent 'deficits' in men to identify existing strengths that may empower men to improve their health and wellbeing. McNulty and Fincham (2012) maintain that 'positive' or 'strength-based' masculinities can be seen as psychological traits that "promote or undermine wellbeing depend(ing) on the context in which they operate" (p. 101).

1.3 Masculinity and age

As Mackenzie, Rodger & Robertson et al. (2017) point out, masculinity is "constantly in flux […] and deeply reliant on context" (p. 2). With this in mind, it is important to consider the nature and practice of masculinities across different age groups. Research has indicated emerging (18 to 25 years) and younger adult (mid-20s to 30s) males may experience heighten concerns over the need to establish their masculine identity and reputation (Arnett, 2000; LaFontana & Cillessen, 2010; de Visser & McDonnell, 2013). Qualitative work by de Visser, Smith and McDonnell (2009) showed that if men engage in behaviours that are considered to be more masculine, such as muscle building, athletic strength, binge drinking and ignoring physical or mental health issues, it would increase the likelihood of being considered more masculine by other men in general. That is, behaviours construct their 'masculine capital' which can be used to establish their masculinity or allow for compensations such as engaging in feminine behaviours (Anderson, 2005; de Visser et al., 2009; de Visser et al., 2013).

In contrast, qualitative interviews with middle (30s to 60s) and older (over 65 years) men suggests that perceptions of masculine ideals and norms are reimagined in response to life stages and changes such as fatherhood (Oliffe, Bottorff & Sarbit, 2012), disease (Stapleton & Pattison, 2015) and bodily changes that come with ageing (Smith et al., 2007; Clarke & Lefkowich, 2018). For example, older men and those experiencing chronic disease value independence (Smith et al., 2007), physical strength (Cormie, Oliffe, & Wooten et al., 2015; Clarke & Lefkowich, 2018) and sexual performance (Chambers et al., 2016). Many measures of masculinity neglect ageing masculinities in favour of hegemonic masculinities, valuing "youthful bodies that are healthy, strong, productive, self-reliant and hyper-sexual" (Clarke & Lefkowich, 2018, p. 18). In order to study developmental differences across the lifespan and how they might affect health-related masculine values, the current study separated men into

three distinct age groups: young men (18 to 29 years), middle-aged (30 to 64 years) and older adulthood (over 65 years) (Arnett, 2000; Arnett, 2001; Oliffe et al., 2019).

1.4 Assessment of masculinity

Over the past 30 years, researchers have developed ways to measure the extent to which people adhere to gendered norms, behaviours and internalised conflicts in the masculine gender role (Wong & Horn, 2016; Wong & Webster, 2016). Most studies have used measures that account for hegemonic masculinities and their association with negative health outcomes. More recently, researchers have developed new tools, built on the underpinnings of positive masculinity, to explore adaptive strengths among men. Below is a brief introduction and critical analysis of the most widely used measures and newly developed tools to assess forms of masculinity.

The Gender Role Conflict Scale (GRCS; O'Neil, Helms, David, & Wrightsman, 1986) was developed to assess the negative psychological health outcomes experienced by men and boys exacerbated by adherence to rigid and dysfunctional male gender roles (O'Neil, 2008). The majority of published reports support the relationship between men's scores on the GRCS and negative health outcomes, including a propensity to violence (Brannon, 1976), excessive alcohol consumption (de Visser, 2009) and resistance to help-seeking (Sharpe & Arnold, 1998). However, a criticism of the GRCS is that it restricts men's responses to "static, simplistic (and perhaps outdated)" assumptions and expectations of what it means to be masculine, how a man should behave and what constitutes dominant forms of masculinity (Galdas, 2009, p. 69).

The Conformity to Masculine Norms Inventory (CMNI; Mahalik, Locke, Ludlow, Diemer, Scott, Gottfried, & Freitas, 2003) has been the most widely used psychometric measure of masculinity (Chambers et al., 2016; Wong, Ho, Wang & Miller, 2017; Gerdes & Levant, 2018;

Levant, McDermott, Parent, Alshabani, Mahalik, & Hammer, 2020). The CMNI deviates from the assumption of GRCS that adherence to masculine norms and ideals leads to psychological stress. The scale was developed to allow researchers and clinicians to assess an individual's conformity or nonconformity to several affective, behavioural and cognitive dimensions of hegemonic gender role norms (see Method section 2.2.2). The hegemonic masculinities (i.e. self-reliance) have been used to explain and predict specific health behaviours among men, including suicide risk (Pirkis et al., 2017) and resistance to mental health help-seeking (Wong et. al., 2017).

The Masculinity in Chronic Disease Inventory (MCD-I) was developed as a contextualised measure of masculinity within older Australian men experiencing prostate cancer (Chambers et al., 2016). Prior to the work of Chambers et al. (2016), there had been no validated measures of masculinity for this specific population. The scale provides a nuanced account of masculinities salient to men experiencing chronic conditions (Occhipinti, Laurie, Hyde et al., 2019). The MCD-I has been found to be a valid measure of masculine beliefs among men with chronic illness that is sensitive to age and sexual health (Chambers et al., 2016; Occhipinti, Laurie, Hyde et al., 2019).

1.5 Criticism of masculinity assessment

As many scholars argue, masculinity theory is in need of conceptual clarification (Elliot, 2015). There is a need to establish what constitutes normative masculinities across age and locale to inform and leverage gendered interventions. The measures discussed above are slightly different in the way masculinity is theorised and operationalised. Perspectives of positive masculine ideology and measures are wide-ranging from global masculinities (Kaplan, Rosenmann & Shuendler, 2017) to context-specific such as homophobia in sport (Anderson, 2009; Anderson, 2018) and fatherhood (Elliot, 2015; Hunter, Riggs & Augoustinos, 2017).

However, most approaches fail to take into account masculinities that guide men's *health* behaviours. Given that in many western countries, including Australia, men experience higher rates of suicide, it is important to examine positive health-related masculinities that may protect against psychological distress.

1.6 Recent advances in the assessment of masculinity

The recently developed Health-Related Masculine Values Scale (HRMVS) (Oliffe et al., 2019) has the potential to address the current gap in masculinity and men's health research. The HRMVS was developed to explore and identify the values that govern health-related behaviours among young Canadian males aged 15 to 29 (n = 630). Using principal components analysis (PCA) the developers retained 12 out of the 15 items that measured two overarching domains: 1. Open & Selfless and 2. Healthy & Autonomous. Recently, an abbreviated eight-item, two-factor model of the scale was validated in a sample of Canadian men (n = 530) by Rice et al. (2020) using confirmatory factor analysis (CFA). However, McCreary and colleagues (2019), in a British sample of men (n = 570), failed to replicate the two-factor model of the original scale using exploratory factor analysis (EFA).

At present there remains a lack of depth and clarity over the factorial structure of the scale. EFA allows for the underlying structure of a set of items to be determined but is not a formal test of significance (DeVellis, 2003). The standard procedure is to follow EFA with CFA, which tests the relationships between items and latent variables (Brown, 2006). To date, none of the three proposed theoretical models — twelve-item, two-factor model (Oliffe et al., 2019); eight-item, two-factor model (Rice et al., 2020); and fifteen-item, single-factor model (McCreary et al., 2019) — have been assessed in an Australian sample of men using CFA.

Moreover, there is mixed support for the psychometric properties of the scale, and it is uncertain whether the scale "is actually measuring masculine values" (McCreary et al., 2019,

p. 64). McCreary et al. (2019) found a lack of evidence to support concurrent validity (i.e., inverse relationship) with a measure of *hegemonic* masculinity (the CMNI-46), and little evidence of convergent validity with measures of health and wellbeing, including professional help-seeking, depression, anxiety, sleep disturbance and smoking. In contrast, Rice et al. (2020) found health-related masculine values were associated with lower depression risk and suicidality among Canadian men with a history of child maltreatment. The preliminary findings provide tentative support for a positive masculinity measure that may contribute to bridging the gap between qualitative and quantitative methods. The HRMVS has the potential to inform and leverage gender-sensitive interventions for men but more research is needed to evaluate and assess the utility of the scale as a measure of men's health-related values.

1.7 Summary

The purpose of this review of research has been fourfold. First, in highlighting that men are an acknowledged high-risk group for depression and suicide, it has been demonstrated there is need to study the gendered nature of health-related values in the context of mental health. Second, the paradigmatic shifts in theorising masculinity in men's health research were reviewed, and the present study advocates for a positive model that promotes men's diversity and strengths. Third, in synthesising and discussing masculinity in men's health research, distilled by age, it is argued that the nature of masculinity is fluid across time and context, and that diversity among men must be acknowledged. Fourth, through the introduction and critical assessment of current measures of hegemonic and contemporary masculinity, it is contended that further validation and evaluation of the HRMVS is needed. Consequently, five aims were developed that will be addressed in the current study (see Table 1).

Table 1

Aims and hypotheses of the present study

Aim 1	**Evaluate HRMVS factor structure using confirmatory design and to determine if HRMVS can be extended across age groups (<29, 30-64,>65)** • This will constitute a purely exploratory analysis due to the conflicting nature of prior research.
Aim 2	**Examine the influence of age on the HRMVS and CMNI-22.** • It is expected that younger men (< 29) are more likely to adhere to masculine values than older men (30 -64 and > 65).
Aim 3	**To assess the concurrent validity of the HRMVS to the CMNI-22.** • It is expected that HRMVS will inversely correlate with the CMNI-22
Aim 4	**Examine the influence of age and depression diagnoses on psychological distress** • It is expected that men experiencing depression are more likely to have significantly higher rates of psychological distress than men with no previous depression diagnosis.
Aim 5	**Explore the convergent validity of the HRMVS by examining associations with indicators of psychological distress.** • The relationship between the HRMVS and indicators of poorer mental health would be significant and inverse.

CHAPTER 2 - Method

2.1 Participants

The sample size consisted of *n* = 2,592 Australian participants (*M* = 58.718, *SD* = 17.215) ranging in age from 18 to 105 years. Participants were drawn from an ongoing study that began in 2019, conducted by the University of Adelaide in collaboration with researchers at the CSIRO and Orygen's National Centre of Excellence in Youth Mental Health. The ongoing study is a cross-sectional investigation of the impact of gender roles on health and wellbeing across the lifespan. This study had ethics approval from the University of Adelaide and the CSIRO Human Research Ethics Committee (HREC approval number: H-2019-109).

2.1 Measures

2.1.1 Demographic characteristics

Participants were asked to disclose their personal characteristics (i.e. gender, marital status, age, education, residence), work (i.e. employment and income before tax) and postcode.

2.1.2 Conformity to Masculine Norms Inventory (CMNI-22)

The CMNI was designed to measure a set of factors identified as being characteristic of hegemonic masculinity (see Introduction 1.5; Mahalik et al., 2003; Parent & Moradi, 2011). The CMNI-22 is comprised of the two items with the highest loadings for each of the 11 factors on the original 94-item scale which include; (1) work (2) playboy (3) self-reliance (4) winning (5) dominance (6) risk-taking (7) emotional control (8) heterosexual presentation (9) power (10) violence and (11) status. All items are scored on a 4-point Likert scale from 1 ('Strongly agree') to 4 ('Strongly disagree') and nine-items were reverse-coded. A total score of 22 (lowest conformity) to 88 (highest conformity) was derived. The abbreviated 22-item scale has

good concurrent validity with the original scale and other widely recognised measures of masculinity (Thompson & Benet, 2015). Owen (2011) noted that subscale scores are more meaningful than total scores. Thus, subscale scores were also computed and reported. In the present study, the CMNI-22 demonstrated adequate internal consistency assessed by McDonald's omega (ω) (ω = .875, 95% CI = .867, .882).

2.1.3 **Health-related Masculine Values Scale (HRMVS).**

The HRMVS was developed to assess the health-related values of young Canadian men (Oliffe et al., 2019). The original scale consisted of 15 statements on a self-report inventory (see Table 2). Each of the five masculine values including selflessness, openness, wellbeing, strength and autonomy are assessed by three items. Items were rated on a Likert scale from 1 ('Strongly disagree') to 5 ('Strongly agree') with higher scores indicating an individual's stronger endorsement of positive health-related masculine values. Internal consistency values (ω) of HRMVS theoretical models are presented in section 3.2, Table 5.

Table 2

HRMVS items and corresponding subscale with Likert scale scores (%).

Items *A man should …*		Subscale	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
1	…be open to new experiences	Openness	29.5	59.2	10.0	1.0	.2
2	…be open to new ideas	Openness	38.4	56.9	4.1	.6	-
3	…be open to new people	Openness	29.2	59.0	10.7	.9	.2
4	…care about other people	Selflessness	50.1	44.7	4.7	.3	.2
5	…help other people	Selflessness	48.1	46.5	4.5	.7	.2
6	…give back to his community	Selflessness	40.3	48.1	10.5	.9	.2
7	…be independent	Autonomy	13.8	41.5	35.4	8.6	.7
8	…make his own decisions	Autonomy	11.2	47.7	32.2	8.7	.2
9	…be self sufficient	Autonomy	11.2	47.1	32.6	8.2	.8
10	…have physical strength	Strength	6.2	34.9	41.0	15.5	2.4
11	…be fit and healthy	Well-being	18.0	59.2	18.2	4.0	.6
12	…stay in good shape	Well-being	14.0	59.0	23.1	3.5	.4
13	…have intellectual strength	Strength	16.8	56.0	23.9	2.8	.4
14	…have emotional strength	Strength	19.8	62.8	15.0	2.4	.3
15	…take care of his appearance	Wellbeing	12.4	61.8	22.3	3.2	.3

2.1.4 **Suicidality**

A single item was used to assess recent suicidal ideation: 'Over the past two weeks, how often have you been bothered by thoughts that you would be better off dead, or of hurting yourself in some way?' This item was derived from the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer & Williams, 2001) and has been found to accurately assess suicidal ideation (Pirkis et al., 2017). This item is scored on a 4-point Likert scale from 0 ('not at all'), 1 ('several days'), 2 ('more than half the days') or 3 ('nearly every day'). Those who scored ≥ 1 were deemed to be experiencing acute suicidal ideation.

2.1.5 **Kessler Psychological Distress Scale (K10).**

This scale is a widely used indicator of psychological distress (Andrew & Slade, 2001). The K10 is based on 10 questions about depressive symptoms and anxiety a person has experienced in the past 30 days. These symptoms include nervousness, restlessness, worthlessness ('no good'), and depressed. The K10 uses a 5-point Likert scale ranging from 0 ('none of the time') to 4 ('all of the time'). A one-dimensional score is the sum of each response, ranging from 10 to 50. McDonald's ω was .946 (95% CI = .943, .953) indicating good internal consistency and stability.

2.1.6 **Depression diagnosis**

The presence of depression was assessed using a single item that asked whether respondents had ever been diagnosed with depression. Participants selected one of three response options: 0 ('No'), 1 ('Yes, but it is no longer impacting me'), or 2 ('Yes, and I continue to be impacted by depression'). Respondents who scored '2' were deemed to be experiencing depression.

2.2 Procedure

The measures described above formed a self-report questionnaire that was available in print and online format. Survey information and an access link to SurveyGizmo (2019) was distributed to a range of relevant organisations and community groups informing them of the study and inviting network affiliates to participate. Printed forms were delivered by a research assistant to various community groups who requested paper copies for their affiliates. An online version of the questionnaire was advertised via paid advertisements displayed to Australian members of the Facebook social networking platform to maximise the total number of respondents. Participants with an elevated risk of depression (i.e., PHQ-9 score above 10) were provided with support options for seeking professional help. Data was collected between August and November 2019.

2.3 Analytic strategy

Data cleaning was performed with IBM® SPSS® Statistics for Windows 26.0 (SPSS) software (IBM Corp., 2019). Prior to analysing data for the specified aims (see section 1.8, Table 1), data (n = 2,592) was collated and assessed for missing values. Little's (1988) Missing Completely at Random test (MCAR) indicated that the missing data were likely to be MCAR (χ^2 = 898.936, df = 1,399, p = 1.000). Given the relational nature of this study, a total of n = 366 respondents (14%) with missing values were excluded from the data. Due to the focus of this study, only those identifying as 'male' were retained for analysis leaving an overall sample size of n = 898 (18 to 93 years). This sample was classified into three age-groups (< 29, 30 to 64 and > 65) (see section 3.1, Table 3) permitting the comparison of the HRMVS in a similar sample in terms of age to Oliffe et al. (2019) and McCreary et al. (2020).

Statistical analyses were conducted using JASP version 0.13.1 (JASP Team, 2020). Regarding the HRMVS, three distinct theoretical models have emerged in previous research. Therefore, confirmatory factor analysis (CFA) was used to provide an objective test of the fit of these solutions to the current sample. Competing theoretical models were judged using commonly reported CFA model fit indices; comparative fit index (CFI); the Tucker-Lewis index (TLI); the root mean error of approximation (RMSEA); and the standardized root mean square residual (SRMR). Recommended by Hu & Bentler (1999), conventional model fit criteria were used (i.e., CFI >.95; TLI >.95; SRMR <.08; RMSEA <.09). The model with best fit was repeated across age-groups to determine its structural stability in different groups of men.

Following recommendations made by Sijtsma (2009), internal consistency was assessed using McDonald's omega (ω). Spearman's correlation coefficient (r_s) was used in the preliminary stages of analysis to assess the relationships between variables. One-way analysis of variances (ANOVA) were used to determine the significance of differences between age-groups on key variables. Post-hoc tests were also employed to establish group differences. Sequential linear regressions were performed to identify whether the HRMVS could significantly predict hegemonic masculinity adherence and poorer mental health outcomes in this population.

CHAPTER 3 - Results

3.1 Participants

Demographic data is presented in Table 3 below. On average the sample was middle-aged, with the majority of respondents in married and/or defacto relationships (67.8%), in full-time work (26.9%) or retired (46.8%), and just under half held a tertiary qualification (44.9%). The proportion of men experiencing acute suicidal ideation approximated 30% and varied across age, with about the same percentage indicating they were currently impacted by depression.

Table 3

Sample demographics and age group comparisons

Demographic		Unit	Full Sample *n* = 898	Age-groups		
				< 29 *n* = 83	30-64 *n* = 401	> *65* *n* = 414
Age (years)	-	M (*SD*)	58.02 (17.754)	24.12(3.376)	49.91(11.775)	72.77(5.792)
Relationship status	Married/Defacto	% (*n*)	67.8(609)	33.7(28)	68.3(274)	74.2(307)
	Single (divorced or separated)	% (*n*)	14.6(131)	2.4(2)	15.0(60)	16.7(69)
	Single (Widowed)	% (*n*)	3.0(27)	1.2(1)	.7(3)	5.6(23)
	Single	% (*n*)	14.0(126)	60.2(50)	16.0(64)	2.9(12)
	Prefer not to say	% (*n*)	.6(5)	2.4(2)	-	.7(3)
Education	Year 11 or Below	% (*n*)	13.4(120)	3.6(3)	10.5(42)	18.1(75)
	Year 12	% (*n*)	10.6(95)	28.9(24)	6.5(26)	10.9(45)
	Certificate III/IV	% (*n*)	13.6(122)	15.7(13)	17.7(71)	9.2(38)
	Diploma/advanced diploma	% (*n*)	16.6(149)	6.0(5)	9.5(38)	20.3(84)
Higher Education	Bachelor degree	% (*n*)	22.6(203)	27.7(23)	27.2(109)	17.1(71)
	Graduate certificate/diploma	% (*n*)	8.9(80)	3.6(3)	9.5(38)	9.4(39)
	Postgraduate (Masters/PhD)	% (*n*)	13.4(120)	14.5(12)	13.5(54)	13.0(54)
	Prefer not to say	% (*n*)	1.0(9)	-	.2(1)	1.9(8)
Employment status	Full time	% (*n*)	26.9(242)	34.9(29)	47.9(192)	5.1(21)
	Part time	% (*n*)	5.3(48)	10.8(9)	6.0(24)	3.6(15)
	Employed casually	% (*n*)	8.2(74)	28.9(24)	9.0(36)	3.4(14)
	Not employed or unpaid work (i.e. domestic duties, carer, volunteer)	% (*n*)	11.2(101)	22.9(19)	17.7(71)	2.7(11)
	Retired	% (*n*)	46.8(420)	1.2(1)	17.0(68)	84.8(351)

	Prefer not to say	% (*n*)	1.4(13)	1.2(1)	2.5(10)	.5(2)
Previous depression diagnosis	Never	% (*n*)	52.0(467)	43.4(36)	41.1(165)	64.3(266)
	Previously	% (*n*)	17.7(159)	12.0(10)	17.5(70)	19.1(79)
	Currently	% (*n*)	30.3(272)	44.6(37)	41.4(166)	16.7(69)
Suicidal ideation	Not experiencing suicidal ideation	% (*n*)	69.7(626)	45.8(38)	62.1(249)	81.9(339)
	Experiencing suicidal ideation	% (*n*)	30.3(272)	54.2(45)	37.9(152)	18.9(75)
Psychological distress	Low	% (*n*)	37.6(388)	12.9(10)	24.7(99)	55.3(299)
	Medium	% (*n*)	21.9(197)	14.5(12)	21.7(87)	23.7(98)
	High	% (*n*)	20.4(183)	21.7(18)	26.4(106)	14.3(59)
	Very High	% (*n*)	20.0(180)	51.8(43)	27.2(109)	6.8(28)

Table 4.

Spearman's correlations between all variables used in the present study.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
(1) HRMVS	-																	
(2) O & S	.635***	-																
(3) H & A	.753***	.160***	-															
(4) CMNI-22	.104**	-.221***	.306***	-														
(5) Winning	.051	-.135***	.198***	.476**	-													
(6) EC	-.032	-.197***	.083*	.349***	.075*	-												
(7) Risk	.114***	.101***	.121***	.340***	.107**	-.069*	-											
(8) Violence	.044	-.064	.090**	.454***	.114***	.038	.152***	-										
(9) POW	-.120***	-.388***	.102**	.502***	.212***	.065*	.101***	.219***	-									
(10) Playboy	.043	-.056	.109**	.474***	.158***	-.023	.161***	.183***	.221***	-								
(11) S-R	.035	-.142***	.120***	.336***	.132***	.367***	-.084*	-.017	.041	.111***	-							
(12) Work	.055	-.051	.118***	.365***	.94**	.078*	.098**	-.010	.086*	.079*	.047	-						
(13) HP	.031	-.192***	.175***	.453***	.146***	.056	.012	.083*	.334***	.061	.067*	.030	-					
(14) DOM	.125***	-.088**	.231***	.510***	.273***	.008	.041	.177***	.283***	.159***	.066*	.218***	.208***	-				
(15) K10	.065	-.035	.053	.169***	.119***	.103**	-.062	.048	-.023	.167***	.408***	.076*	-.094**	.105**	-			
(16) PHQ-9	.039	-.035	.057	.160***	.075*	.090**	.007	.079*	.003	.155***	.339***	.081*	-.068*	.019	.644***	-		
(18) Age	-.126***	-.080*	-.067*	-.085*	-.067*	.048	.007	-.160***	.077*	-.171***	-.143***	-.018	.206***	-.143***	-.486***	-.318***	-.301***	-

Note: * $p \leq .05$; $p = .001$**; $p < .001$***. HRMVS= Health-Related Masculine Values Scale; O & S= Open & Selfless; H & A= Healthy & Autonomous; EC = emotional control; Risk = Risk-Taking; POW= Power; S-R = Self-Reliance; HP = heterosexual presentation; DOM = Dominance.

3.2 Aim 1: Evaluating the factor structure of the HRMVS

In order to evaluate the best fitting model, three theoretical models were tested and compared using CFA (see Table 5). The first test was the unitary factor solution with 15 items, as proposed by McCreary et al. (2019) but this model had inadequate model fit as illustrated by fit indices: RMSEA was above .10 and CFI and TLI were below .90. Next, the two-factor solution with 12 items proposed by Oliffe et al. (2019) was run. Although this solution had better fit than the single-factor model it was overall still inadequate. The third solution tested was the 8-item, two-factor model proposed by Rice et al. (2020). This model had substantially improved fit indices and met Hu & Bentler's (1999) recommendations for adequate model fit. For the HRMVS-8, all item-factor loadings were significant (p = < 0.001 (see Figure 1). Items on the Open & Selfless factor demonstrated strong factor loadings (> 0.40). Three items on the Healthy & Autonomous factor had strong factor loadings (> 0.40). However, item 10 '*A man should have physical strength'* was only marginally loaded with a lower factor loading of .46.

To determine if the HRMVS-8 model could be applied to age groups, sequential CFAs were run within age groups. Fit indices shown in Table 5 indicated model fit was acceptable in the 30 to 64 and > 65 age-groups, but only a marginal fit for the youngest group < 29. All factor loadings were significant (p = < .001) and are provided in Figure 2. McDonald's ω was calculated for this 8-item version of the HRMVS in the overall, combined sample and indicated poor internal consistency and stability (ω = .571).

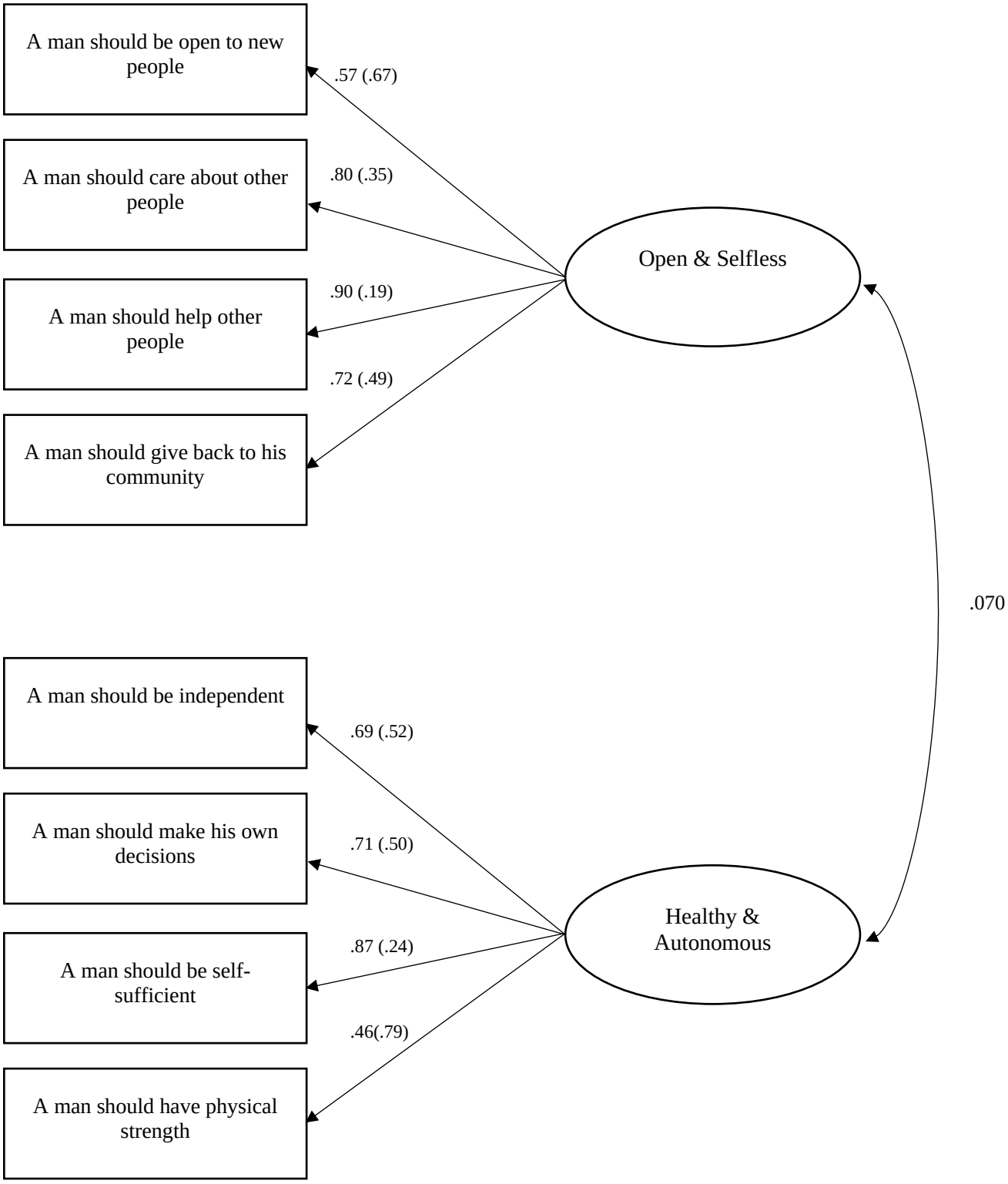

Figure 1. HRMVS-8 factor loadings (and standard error values) for full sample (*n* = 898)

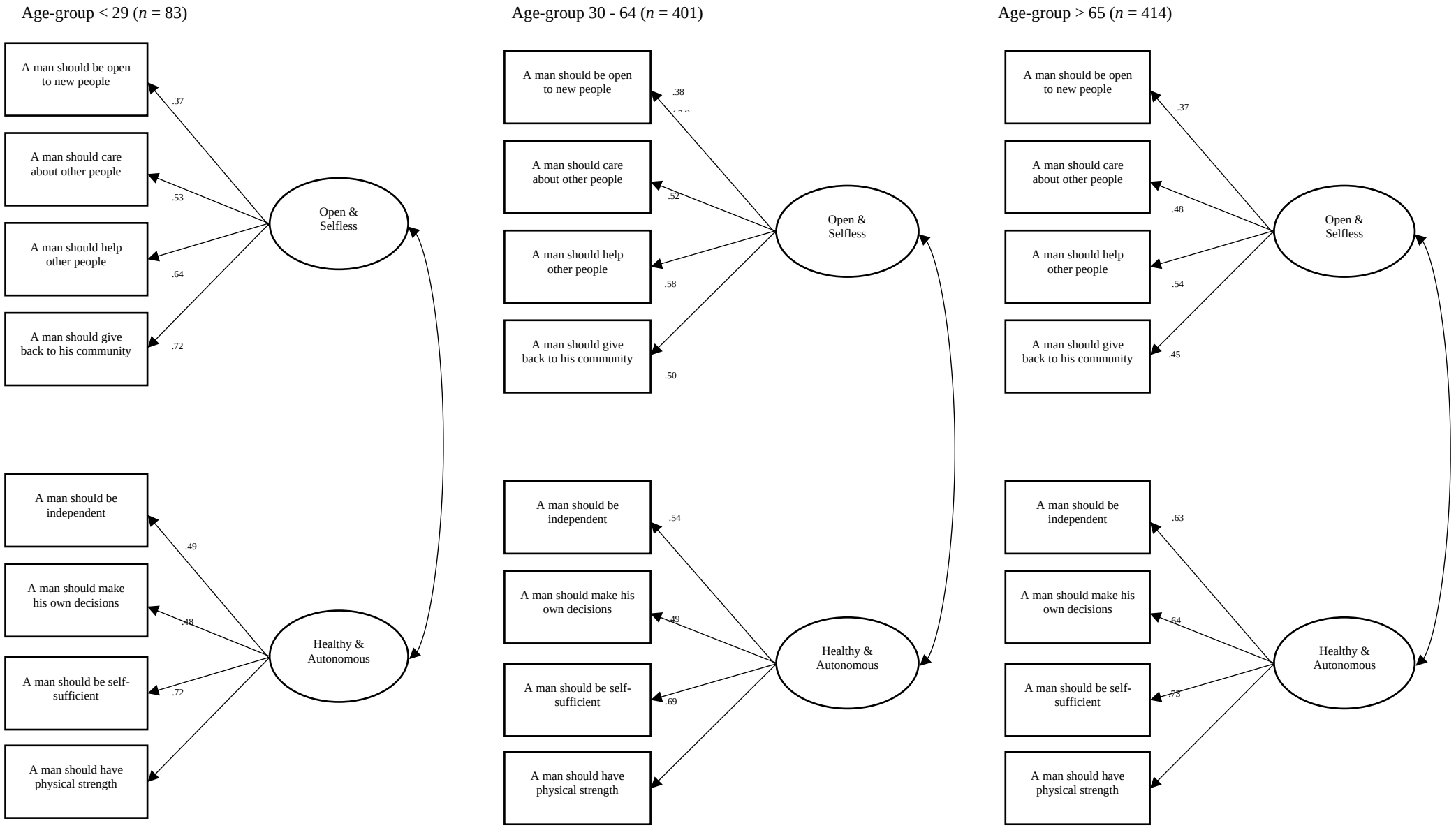

Figure 2. HRMVS-8 factor structure with factor loadings (and standard error values) for each age-group

Table 5. *Internal consistency values and model fit indices for the HRMVS theoretical models*

Model (study)	Sample (*n*)	Items	Total ω	Open & Selfless ω	Healthy & Autonomous ω	*df*	χ2	*p* value	CFI	TLI	RMSEA	Low 95% CI	High 95% CI	SRMR
Single factor (McCreary et al. 2019)	Full male sample (898)	15	.785	-	-	90	3461.420	< .001	.436	.342	.204	.198	.210	.176
Two-factor (Oliffe et al. 2019)	Full male sample (898)	12	.722	.863	.770	53	1607.596	< .001	.684	.607	.181	.173	.188	.116
Two-factor (Rice et al. 2020)	Full male sample (898)	8	.571	.837	.778	19	49.370	< .001	.988	.982	.042	.028	.057	.027
Two-factor (Rice et al. 2020)	< 29 (83)	8	.512	.864	.745	19	36.536	< .009	.927	.892	.105	.052	.157	.071
Two-factor (Rice et al. 2020)	30 - 64 (401)	8	.634	.836	.755	19	36.863	<.008	.984	.977	.048	.024	.072	.040
Two-factor (Rice et al. 2020)	> 65 (414)	8	.699	.830	.797	12	37.603	<.001	.977	.959	.072	.047	.098	.032

Note: ω = McDonald's omega coefficient; *df* = degrees of freedom; *p* = <.05; χ2 = chi-squared test; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; and SRMR = standardised root mean square residual. Conventions: CFI >.095; TLI >.95; RMSEA = <.09; and SRMR = <.08 (Hu & Bentler, 1999).

3.3 Aim 2. The influence of age on the HRMVS and CMNI-22

Descriptive statistics, as shown in Table 4, suggest that adherence to masculinity as measured by either scale varies across age-groups. Males aged < 29 had the highest mean scores across these variables (see Figure 3 demonstrating size of effect). Although the histograms indicated the data was negatively skewed, one-way analysis of variance (ANOVA) was used to establish degree of difference between groups. The assumption of homogeneity of variance (Levene's *F* test, see Table 6) was satisfied for all variables and Bonferroni post hoc tests were used to confirm the nature of differences between groups.

Table 6

Descriptive statistics per age group on masculinity scales and/or domain.

	Age-groups			
Masculinity scale and/or domain	< 29	30- 64	> 65	Levene's *F* Test
HRMVS-8	32.78(3.47)	31.45 (3.355)	30.98 (3.50)	F (2, 895) =.075, p = .928
Open & Selfless	26.386 (3.154)	25.850 (3.038)	25.616 (2.843)	F (2, 895) = 1.791, p = .167
Healthy & Autonomous	22.916 (3.599)	21.815 (3.193)	21.560 (3.386)	F (2,895) = .559, p = .572
CMNI-22	56.71 (10.74)	54.40 (9.92)	53.44 (9.55)	F (2, 895) =.513, p = .599

Note: *M* = mean; *SD* = standard deviation.

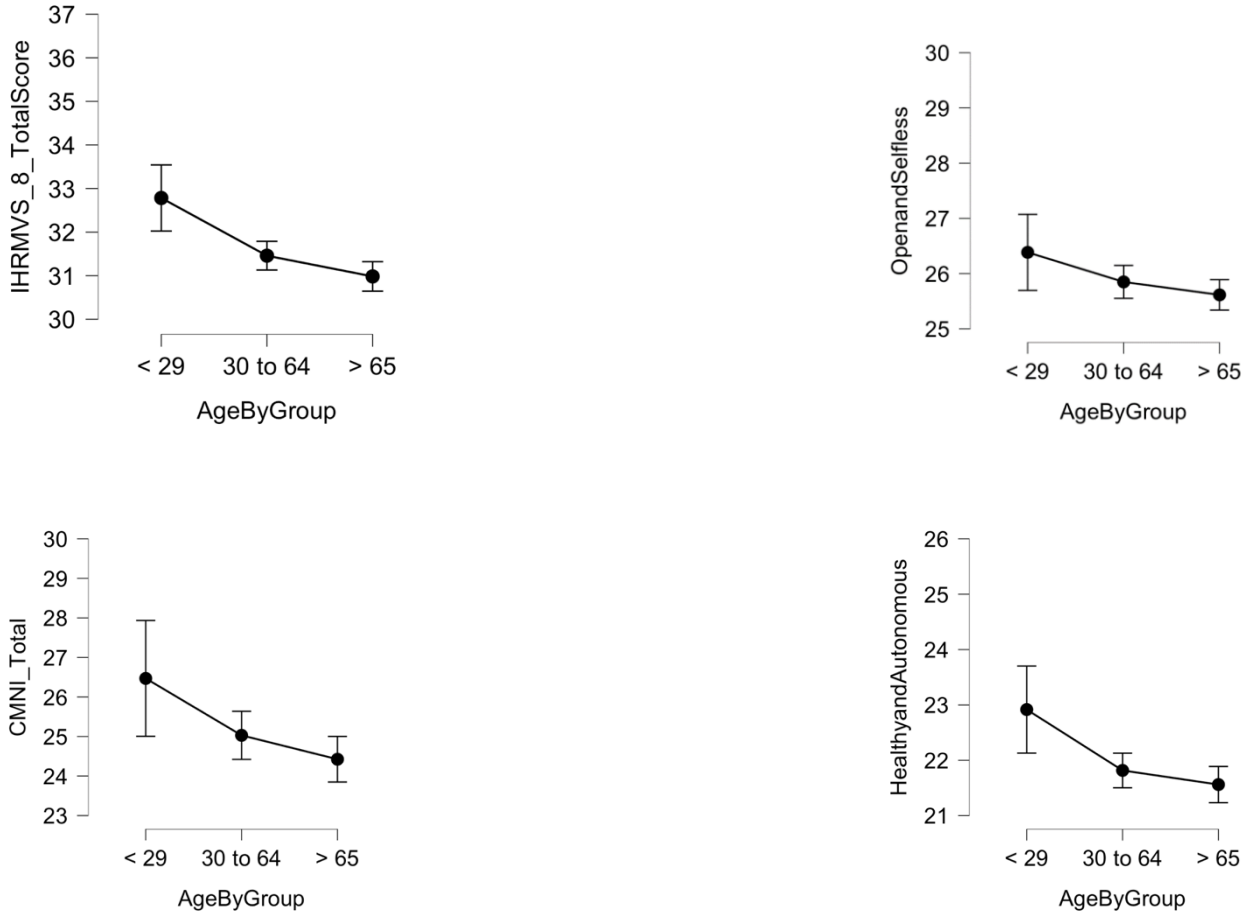

Figure 3. Descriptive plots for HRMVS-8, domains and CMNI-22 by age groups

HRMVS-8. The ANOVA yielded a statistically significant effect, F (2, 895) = 9.776, p = < .001, η^2 = .021. A post-hoc test (Bonferroni) confirmed differences between males < 29 and age-groups 30-64 (t (895) = 3.196, p = .004) and > 65 (t (895) = 4.356, p = < .001). However, no differences were evident between 30 - 64 and > 65 (t (895) = 1.976, p = 0.145).

Open & Selfless (HRMVS-8). The ANOVA indicated no statistically significant age-group differences on the Open & Selfless, F (2, 895) = 2.478, p = 0.84, η^2 = .006.

Healthy & Autonomous (HRMVS-8). The ANOVA demonstrated a significant difference between age groups, F (2,895) = 5.762, p = .003, η^2 = .013. Bonferroni post-hoc comparisons revealed differences between < 29 and age-groups 30-64 (t(895) = 2.746, p = .018) and >65 (t(895) = 3.392, p = .002), but no difference between 30-64 and >65 (t(2,895) = 1.096, p = .820).

CMNI-22. Results from the ANOVA indicated a statistically significant effect, F (2,895) = 4.037, p = .018, η^2 = .009. Upon further examination, Bonferroni post hoc comparisons showed statistically significant differences between < 29 and > 65 age-groups (t (2,895) = 2.769, p= .017). While comparisons between < 29 and 30-64 (t (2,895) = 1.944, p = .156) and between 30-64 and > 65 (t (2, 895) = 1.406, p = .481) revealed no significant differences.

3.4 Aim 3. Concurrent validity

Descriptive statistics (see section 3.1, Table 4) suggested that HRMVS-8 is weakly correlated with CMNI-22 (r_s = .104, p = .002). In addition, Open & Selfless scores were

inversely correlated (r_s = -. 221, p = <.001), whilst Healthy & Autonomous scores were positively correlated with the CMNI-22 (r_s = .306, p = <.001). Given that age was found to influence these variables (see section 3.3), linear regressions were used to assess the concurrent validity of HRMVS-8 (as well as its sub-domains) and CMNI-22 whilst controlling for age. Visual inspection of histograms indicated normal distributions for all variables. Regression residual plots were inspected to address assumptions of linearity, homoscedasticity and normality of errors.

Results of the various regression models are shown in Table 7. The overall Model 1 regression equation for HRMVS-8 and CMNI-22 was significant, F (2, 895) = 13.920, p = < .001, with an R^2 = .030. The direct effect of HRMVS-8 on CMNI was positive but weak in magnitude. Model 2 regression analyses incorporating Open & Selfless and CMNI-22 also revealed a significant association, F (2, 895) = 23.953, p = < .001, with an R^2 = .051. The direct effect of Open & Selfless on CMNI-22 was weak to moderate and these variables were inversely related. The final regression analyses exploring the impact of Healthy & Autonomous scores on CMNI-22 was also significant, F (2, 895) = 52.427, p = < .001, with an R^2 = .105. The direct effect of Healthy & Autonomous scores on CMNI-22 was weak to moderate and significantly positively related.

Table 7

Summary of Linear Regression Analysis for HRMVS-8 (and domain scores) Concurrent Validity with the CMNI-22

	Predictors	B	SE B	β	95% CI Lower	95% CI Upper
Model 1	HRMVS-8	.068	.019	**.121****	.031	.105
Model 2	Open & Selfless	-.104	.016	**-.216****	-.135	-.073
Model 3	Healthy & Autonomous	.171	.017	**.315****	.137	.205

Note: **$p \leq .001$; all models accounted for age (effects now shown here).

3.5 Aim 4: The influence of age and previous depression diagnosis on psychological distress

Given the intention to consider the influence of masculinity scales on measure of psychological distress, there was a need establish any relationship between age or a previous depression diagnosis and indicators of psychological distress (i.e., K10 and Suicidality). Visual inspection of histograms indicated slight negative skew for K10 and Suicidality. For each model, residual plots were inspected to ensure assumptions of linearity, homoscedasticity and normality of error were met.

Psychological Distress. Results indicated that there was a collective significant effect of age and previous depression diagnosis on psychological distress (i.e., K10), F (2,897) = 355.781, p = < .001, R^2 = .443. Results presented in Table 8 indicate that age was a significant inverse predictor (p = <.001) and previous depression diagnosis was a significant positive predictor (p = <.001) of psychological distress.

Suicidality. Similar results indicated that there was a significant collective effect of age and previous depression diagnosis on suicidal ideation (i.e., PHQ item 9), F (2,897) = 117.890, p = < .001, R^2 = .209. Age was a significant inverse predictor (p = <.001) and previous depression diagnosis was a significant positive predictor (p = <.001) of suicidal ideation (see Table 8).

Table 8

Regression Analysis for Age and Previous depression diagnosis on indicators of poorer mental health outcomes

Predictors	Outcome	B	SE B	*β*	95% CI Lower	95% CI Upper
Age	Psychological distress	-.184	.014	**-.348****	-.211	-.157
	Suicidal ideation	-.010	.001	**-.211****	-.013	-.007
Previous depression diagnosis	Psychological distress	9.766	.530	**.479****	8.727	10.806
	Suicidal ideation	.655	.058	**.351****	.541	.768

Note: ** $p < .001$

3.6 Aim 5: To assess the convergent validity of the HRMVS with psychological distress

Linear regressions were carried out to determine the influence of masculinity scores on measures of psychological distress. Two models were run for each outcomes measure: Model 1 included HRMVS-8 total scores whereas model 2 included the sub-scores given that they were differentially related to the CMNI-22. Given previous results indicating that age and previous depression diagnosis had a significant effect on measures of psychological distress, models were adjusted for these variables. Regression residual plots indicated assumptions of linearity, homoscedasticity and normality of error were met.

Psychological distress. A linear regression found that HRMVS-8 and CMNI-22 explained a significant amount of variance in psychological distress (i.e., K10), F (4, 893) = 173.165, p = < .001, R^2 = .437. The analysis indicated that CMNI-22 significantly predicted psychological distress, however, HRMVS-8 did not significantly predict this outcome (p = .474) (see Table

9). Model 2 indicated a significant collective effect between the HRMVS-8 domains, CMNI-22 and psychological distress, $F(5,892)= 139.145$, $p < .001$, $R^2 = .438$. While the CMNI-22 was found to be a significant predictor, neither Open & Selfless ($p = .176$) or Healthy & Autonomous ($p = .366$) were significant predictors of psychological distress ($p = .077$).

Table 9
Summary of the linear regression analysis for masculinity predicting psychological distress

	Predictors	B	SE B	β	95% CI Lower	95% CI Upper
Model 1	HRMVS-8	.049	.069	.018	-.086	.185
	CMNI-22	.227	.039	**.149****	.151	.303
	Age	-.182	.014	**-.345****	-210	-.155
	Depression diagnosis	4.807	.278	**.452****	4.261	5.353
Model 2	Open & Selfless	-.114	.084	-.036	-.280	.051
	Healthy & Autonomous	.070	.077	.025	-.082	.221
	CMNI-22	.203	.042	**.133****	.120	.286
	Age	-.183	.014	**-.347****	-.211	-.156
	Depression diagnosis	4.796	.278	**.451****	4.250	5.342

Note: * $p \leq .05$; ** $p \leq .001$.

Suicidal ideation. Regression results indicated that HRMVS-8 and CMNI-22 explained a significant amount of variance in predicting suicidal ideation (i.e., PHQ item 9), F (4, 893) = 64.978, $p = < .001$, $R^2 = .225$. It can be seen in Table 10, CMNI-22 did significantly predict suicidal ideation, however, HRMVS-8 failed to reach significance ($p = .803$). It was evident in

Model 2 that Open & Selfless (p = .114) and Healthy & Autonomous (p =.428) did not significantly predict suicidal ideation.

Table 10

Summary of the linear regression analysis for masculinity predicting suicidal ideation.

	Predictors	B	SE B	β	95% CI Lower	95% CI Upper
Model 1	HRMVS-8	.002	.007	.007	-.013	.016
	CMNI-22	.018	.004	**.130****	.010	.026
	Age	-.009	.002	**-.195****	-.012	-.006
	Depression diagnosis	.661	.057	**.354****	.549	.774
Model 2	Open & Selfless	-.014	.009	-.050	-.032	.003
	Healthy & Autonomous	.007	.008	.026	-.010	.023
	CMNI-22	.016	.005	**.112****	.007	.024
	Age	-.010	.001	**-.200****	-.013	-.007
	Depression diagnosis	.658	.058	**.352****	.545	.771

Note: * $p \leq .05$; ** $p \leq .001$.

CHAPTER 4 - Discussion

The present study aimed to evaluate the factor structure and psychometric properties of the Health-Related Masculine Values Scale (HRMVS; Oliffe et al., 2019) in the context of men's mental health. Results obtained in this study demonstrate mixed support for the reliability and validity of the abbreviated eight-item, two-factor model of the HRMVS, with several of the study's hypotheses only partially supported. Prior to providing a detailed discussion of key points, the summary of the findings of this study are as follows:

1. provided a confirmatory validation of the abbreviated eight-item, two-factor model of the HRMVS, which was found to be stable across age-groups;
2. revealed that age has a significant influence on adherence to masculinities measured on the HRMVS-8 and CMNI-22, with younger men experiencing higher conformity to masculine norms compared to middle aged and older men;
3. found that age and previous depression diagnoses are significant predictors of psychological distress, with younger men and/or those with a history of depression suffering from higher levels of psychological distress and suicidality than older age-groups;
4. demonstrated a weak-to-moderate association between HRMVS-8 and the CMNI-22;
5. revealed that the HRMVS-8 neither protects against nor heightens the degree of psychological distress. The scale is unrelated to these outcomes.

4.1 Aim 1

The first aim of this study was to determine the model of best fit for the HRMVS within and across a sample of Australian men.

Factor Structure. Confirmatory analysis replicated the eight-item, two-factor model previously reported by Rice et al. (2020). Hu & Bentler's (1999) cut-off criteria for fit indices were not met with CFI and TLI indices greater than 0.9. This solution supports the two-factor structure proposed by Oliffe et al. (2019). Analysis indicated that the scale was stable across age-groups. Close similarities between factor-structure demonstrates that openness, selflessness, autonomy and physical strength are positive masculinities endorsed by Australian men across age groups. Similar to the findings of Oliffe et al. (2019) and Rice et al. (2020), the analysis indicated that men's responses reflect two overarching latent constructs: Open & Selfless and Healthy & Autonomous. That said, factor analysis indicated that the two domains are weakly related. This relationship is interesting as previous research has found moderate correlations between the two latent constructs (Oliffe et al., 2019; Rice et al., 2020) yet in this sample of Australian men, the scale measures largely *unrelated* masculine values.

Internal Consistency. Reliability of the HRMVS-8 was assessed for internal consistency, which examined whether the items designed to measure each latent construct produced similar scores (Hays & Revicki, 2005). The internal consistency for the overall HRMVS-8 was poor; however, the domains indicated adequate (> .7) internal consistency. This suggests that the subscale scores are more meaningful than the combined scale. Thus, the following interpretations will discuss the findings of each domain. From the initial analyses, these data are the first to provide confirmatory support for the abbreviated, eight-item, two-factor model of the HRMVS (i.e. HRMVS-8) in Australian men.

Open & Selfless Domain. The current study revealed that men do adhere to the values of caring and connecting. The values identified in the current study extend beyond static and traditional male gender roles, with caring and concern for others often associated with femininity (Elliot, 2015). This finding is of particular interest, as it provides quantitative evidence into the departure from traditional masculine ideals, such as domination, power over

women and sexual prowess, toward the incorporation of caring, supportive and communal values. This supports theoretical notions of caring (Elliot, 2015), inclusive (Anderson, 2009), positive (Hammer & Good, 2010; Englar-Carlson & Kiselica, 2013), and new (Kaplan et al., 2017) masculinities. As theorists of positive masculinity point out, values of openness and selflessness are already intertwined with men's conceptualization of masculinities, although they were "in need of reconstruction" (Elliott, 2015, p. 246). This finding provides much needed quantitative support for theories of positive masculinities which have relied on qualitative and therapeutic discourse. For example, a recent qualitative study on smoking cessation found that concern for others supported motivational behaviour change, especially in men embarking on fatherhood (Oliffe et al., 2012). The HRMVS-8 provides a means to quantify contemporary masculinities in relation to men's health and wellbeing. It is possible that higher endorsement of the Open & Selfless domain can motivate positive health behaviours as some men seek to look after their own health and wellbeing as a means to support and care for others. It is worth exploring whether health-related masculine values measured on the Open & Selfless domain can be developed to support strength-based interventions when working with men.

Healthy & Autonomous Domain. The present study shows, in addition to the values discussed above, that men also value autonomy and physical strength measured by the Healthy & Autonomous domain. The current findings suggest that self-sufficiency and independent decision making are important values that guide men's attitudes and behaviours regarding their own health. Autonomy has long been established as a form of hegemonic masculinity that has deleterious impacts on men's mental health and psychological help-seeking (Pirkis et al., 2017; Wong et al., 2016). A meta-analysis (n = 19, 453) found self-reliance was significantly, robustly ($r \geq .1$), and consistently associated with negative mental health reports among men (Wong et al., 2017). Moreover, Bamonti, Price & Fiske (2014) demonstrated that a greater

value placed on autonomy among older men increased the relationship between depressive symptoms and suicide risk. In contrast, qualitative research has found that key aspects of independence (i.e., autonomy) were important indicators of successful ageing among older Australian men (Smith et al., 2007). The current analysis suggests, contrary to longstanding quantitative findings, that it may be unrepresentative to frame autonomy as a barrier to positive health outcomes. However, closer scrutiny is warranted to establish *how* and to *what extent* autonomy influences men's behaviours, particularly toward mental health.

It also appears that physical strength is an important value among men in the context of health and wellbeing. This marks a theoretical difference between the HRMVS-8 and the CMNI. Physical strength (i.e., physical toughness) failed to emerge as a significant factor during scale development of the CMNI (Mahalik et al., 2003, p. 8). However, the recently developed MCD-I by Chambers et al. (2016) found physical strength was an important characteristic of masculinity among men experiencing prostate cancer. This finding highlights the importance of *context*. As mentioned previously, masculine norms are plural constructions of cultural standards and principles of what it means to 'be a man' which are fluid across time and context (Levant, 1995; Pleck, 1995; Addis & Cohane, 2005). In Messerschmidt's (1993) critique, he notes "'Boys will be boys' differently, depending upon their position in social structures" (p. 87). In other words, there is a similar masculine ideology that men may endorse, but different men enact and practise these ideals in different ways depending on situational context. It may be that physical strength becomes more salient in the context of health and wellbeing. This is a concern given that the large majority of masculinity measures, including the CMNI, exclude physical strength.

HRMVS-8 in the Australian Population. This study is the first to undertake an assessment of the HRMVS-8 in a sample of Australian men and provides preliminary evidence to suggest that the scale is geographically-dependent. Previous work has validated the two-

factor structure in Canadian samples of men, the scale's intended target population. When McCreary utilized this scale with British men aged 18 to 80 years, the two-factor model failed to replicate. In the present study, the two domains of masculinity were largely unrelated, which is contrary to findings in Canadian men. Therefore, it is likely that cultural differences in the endorsement of masculinities on the HRMVS-8 are dependent on social and political values of the sample. For example, the items 'A man should care about other people' and 'A man should be open to new ideas' failed to load in a sample of British men. However, the items were endorsed by men in the Canadian study and by Australian men in the present study. In a longitudinal study, Courtenay (1998) found that across young American men most agreed that a man should be 'tough', however, *how* each man demonstrated being 'tough' varied. The 'how' was dependent on age, ethnicity, socioeconomic status and sexuality (Courtenay, 1998). The present study highlights the complex relationship between masculinity, culture and context that needs to be acknowledged in masculinity and men's health research. In line with recommendations by Oliffe et al. (2019), the current study contributes to bridging the gap between qualitative and quantitative insights into contemporary masculinities. The study demonstrates a shift in masculine ideology and further emphasises the need for *context* to be considered when developing and evaluating measures, to account for nuances across age, culture and context.

4.2 Aim 2

The study's second aim was to determine whether age had a significant influence on men's conformity to masculinities assessed on the HRMVS-8 and CMNI-22. The hypothesis that adherence to masculinities would change as a function of age was mostly supported when considering total scores on these measures, although discrepancies emerged for HRMVS-8 domains. Specifically, younger adults reported higher scores on the HRMVS-8, Healthy & Autonomous domain and the CMNI-22 compared to middle-aged and older adults. These

findings are supported by Rice et al.'s (2011) study which demonstrated young Australian men held deeper attitudes towards traditional masculinities, assessed on the CMNI-22, compared to middle-aged and older adults. Scores on the Open & Selfless domain, however, did not differ across age groups suggesting that openness and selflessness does not change as a function of age.

From a developmental perspective, boys and young men are socialised to engage in masculine ideals and norms, such as being stoic, strong and being uncaring about their health or unwilling seek help in times of crisis (Henslin, 1999; Levant, 1995). Further, male emotional expression is expected to be restrained, even more so when it may make men appear weak or vulnerable (e.g. by crying) (Levant, 1995; Pollack, 1998). It has been suggested that young adulthood (18 to 30 years) is a period of fluid identity formation when masculine attitudes and ideals are heightened and reinforced (Galambos, Almeida, & Peterson, 1990). In this period attitudes of what it means to 'be a man' are internalised by boys and young men. With this in mind, it is unsurprising that younger men expressed stronger endorsement of masculinities compared to middle-aged and older men.

It is possible, given that the HRMVS-8 was developed from qualitative interviews with young Canadian men, that the masculine values may not be relevant to middle and older age-groups. Qualitative work suggests older men revaluate their masculine identity in response to life changes such as decreased physical or sexual abilities (Clarke & Leftowich, 2018).

It is important to recognise the intersectionality between age and men's conformity to masculine norms. It is too early to suggest that the HRMVS-8 is sensitive to changes in masculine identity across age groups. Rather, the conceptualisation of HRMVS-8 masculine norms may be better understood as a means to broaden the scope of masculinities that younger men engage in to guide their health behaviours. Future research examining HRMVS-8 scores

across age would need to verify whether middle and older adult males share similar conceptualisations of health-related values.

4.3 Aim 3

The third aim of the study was to assess concurrent validity of the HRMVS-8 against a measure of hegemonic masculinity, the CMNI-22. These data suggest poor concurrent validity between the two scales when using total scores. Further, HRMVS-8 Open & Selfless showed a negative relationship with the CMNI-22 whereas HRMVS-8 Healthy & Autonomous scores were positively associated with the CMNI-22.

It is theoretically unsurprising that the Open & Selfless domain was inversely correlated with the CMNI-22, as the masculinities on this domain may appear intrinsically more feminine. However, the weak-to-moderate relationship between the overall HRMVS-8 Healthy & Autonomous domain with the CMNI-22 was unexpected. Previous research has found some low-to-moderate overlap between existing measures of masculinity (Mahalik et al., 2003; O'Neil, 2008). One possibility is that the HRMVS-8 measures similar constructs to the CMNI-22. For example, the HRMVS-8 assessed men's autonomy (i.e., item 9 'A man should be self-sufficient'). This item is similar to the notion of independence measured on the CMNI-22 (e.g. item 22 'It bothers me when I have to ask for help'). However, developers of HRMVS-8 intended the scale to assess conceptualizations of positive masculinities. What theoretical and/or psychometric assumptions may have led to the overlap between HRMVS-8 and the CMNI-22, remain unclear.

The lack of convergence between the HRMVS-8 and a validated measure of *masculine* values suggests that the HRMVS-8 may be measuring androgynous (i.e. gender-neutral) values. Early work by Bem (1974) introduced the concept of *psychological androgyny*, which is the idea that "individuals may be both masculine and feminine, both assertive and yielding,

both instrumental and expressive, depending on the situational appropriateness of these behaviours" (p. 155). It may be that the HRMVS-8 is a measure of androgynous values that both men and women could embody. Future research should explore the androgynous nature of health-related masculine values among both male and female populations.

4.4 Aim 4

The fourth aim was to examine the influence of age and previous depression diagnosis on levels of psychological distress. Similar to the findings of Rice et al. (2011), the hypothesis that men with a history of psychological distress would experience higher levels of psychological distress was supported. Empirical research has long established that one of the strongest predictors of suicide is depression (Yoshimasu, Kiyohara, & Miyashita, 2008). This finding encourages intervention to have a direct focus on individuals identified as at-risk.

In relation to whether age predicted psychological distress in the sample, the results were noteworthy. Previous research has found that older Australian men may be at a greater risk of experiencing depressive symptoms and suicidality (Burns, 2016). However, this was not indicated in the present study. The results demonstrated that age was a significant inverse predictor of psychological distress. Although this result could be partly explained by the cross-sectional nature of the present study, it is possible that the development of coping flexibility throughout the lifespan underlies the current findings. The term 'coping flexibility' refers to the ability to modify one's strategies for coping in response to stressful demands in a given situation (Kato, 2012). A longitudinal study demonstrated that coping styles are established during middle and older adulthood (Martin-Joy, Malone, Cui et al., 2017). Coping flexibility has been associated with more adaptive outcomes (Cheng, Lau & Chan, 2014). For example, in young Japanese and Chinese adults, flexible coping styles have been strongly associated with lower depressive symptoms over time (Cheng, 2005; Lam & McBride-Chang, 2007; Kato,

2015). Future research may explore whether decreases in conformity to masculine norms across the lifespan is associated with an increase in coping flexibility.

4.5 Aim 5

The study's fifth aim sought to examine convergent validity by exploring the relationship between HRMVS-8 and indicators of psychological distress, namely depressive symptoms and suicidality. The present study could not establish a significant relationship between HRMVS-8 (and scale domains) and psychological distress. These findings indicate that the endorsement of HRMVS-8 masculinities contributes little to depression and suicidality among Australian men. The current finding challenges Rice et al.'s (2020) study which reported that adherence to HRMVS-8 was associated with lower depression and suicide risk in Canadian men who had a history of child maltreatment. To date, the only other reported finding on convergent validity has been a weak but significant association between alcohol use, assessed on the Male Depression Risk Scale (MDRS), and the single-factor HRMVS model among older British men (McCreary et al., 2019). While the inverse association between the two variables suggests a protective relationship, the finding was inconsistent in a younger sample of British men. The authors claimed the association was so weak it was "meaningless" (McCreary et al., 2019, p. 65) in terms of practical significance. It is unclear at this stage which aspects of men's psychological strengths (i.e. Open & Selfless or Healthy & Autonomous) protect against psychological distress, particularly in those considered at static risk (i.e., previous depression diagnosis).

The findings of the present study may reflect the ambiguity of the abbreviated scale in the context of health and wellbeing. This ambiguity may have derived from the process model re-specification and evaluation undertaken by Rice et al. (2020). The small set of items that were retained concerned values of openness, selflessness, autonomy and physical strength. The

abbreviated scale excludes wellbeing as a core value among men. While the scale may measure values endorsed by men across age, it may not be measuring men's *health*-related values. Taking this into consideration, it is unsurprising that the scale showed no significant relationships with mental health outcomes. In other words, it remains unclear whether the abbreviated HRMS-8 in the current study measures men's *health*-related values.

4.6 Limitations and methodological considerations

A limitation of this study is the cross-sectional design. In providing a fixed snapshot of Australian men's health-related values, the current study makes the assumption that their endorsement of masculinities at a particular point in time reflects their general conformity to masculinity. It overlooks the situational (i.e., health) and/or context-specific (e.g. presence of chronic disease) nature of masculinities, and limits the investigation of generational changes in masculinities. Although longitudinal designs are time-consuming and costly, they would allow the examination of adherence to masculinity as a function of age and psychological maturation (i.e. coping flexibility). It is acknowledged that the current study is limited in analysing associations, rather than causal relationships, at a single point in time.

Further, ethnicity data were not collected in the current study, thus limiting our ability to examine the transferability of masculinities across a broader population of diverse Australian men. Many studies have recruited Caucasian, university-aged, middle- to upper-class participants, or in some cases neglected descriptive statistics beyond age and gender (Courtenay, 1998). Consequently, this may have restricted the generalisability of the findings and raises the issue of how studies of masculinity can be applied to diverse male populations.

Another limitation is the phenomenon of response bias in some self-reporting measures, wherein respondents may agree to items rather than disagree in order to present themselves more favourably. Further, the linguistic structure of some HRMVS-8 items (i.e. those

beginning with '*A man should*') may have caused some uncertainty in participants' responses. It is possible that responses were made in accordance with societal norms and ideals, rather than reflecting respondents own personal positions, despite their being instructed to reflect on their own agreement or disagreement with the statements.

4.7 Implications for future research

The present study contributes to the body of masculinity research related to men's health by evaluating the utility of HRMVS-8, with a focus on Australian men. As some scholars argue (Oliffe et al., 2019; Rice et al., 2020), utilising a positive measure of masculinity that assesses health-related values most salient to men, may provide more effective gender-sensitised health interventions. However, the findings call into question the robustness of the HRMVS-8 as a measure of men's strength-based health-related values. Although the scale appeared to be reliable in previous studies (Oliffe et al., 2019; Rice et al., 2020), these results indicate that HRMVS-8 might be an unreliable scale in Australian men. Further, the scale Healthy & Autonomous domain was moderately correlated with a measure of hegemonic masculinity and the overall scale failed to significantly correlate with psychological distress measures. The lack of concurrent and convergent validity is of particular concern given the HRMVS-8 was designed as a measure of positive masculinities that are purportedly protective against negative health outcomes. From these findings, it is evident that a substantial evaluation and reassessment is needed. Until such validation has been conducted, caution should be used when using the HRMVS-8 as a measure of masculine health-related values. Aside from these issues, this study provides new insights into contemporary masculinity that extend beyond monolithic gender ideals through the incorporation of caring, open and selfless masculine values. Furthermore, it highlights the importance of continuing to reconsider masculinities as plural, fluid constructs that vary across age, context, time and culture.

4.8 Conclusion

This study was the first to provide a confirmatory assessment of the Health-related Masculine Values Scale in an Australian population, and replicated the eight-item, two-factor model (HRMVS-8). The current findings revealed that the HRMVS-8 did not demonstrate concurrent validity against a measure of hegemonic masculinity and failed to reveal convergent validity with indicators of psychological distress. It is recommended that to confirm the utility of the HRMVS-8 beyond research settings, more work is needed to demonstrate the utility of the scale as a measure of *positive, masculine health*-related values. The ideas discussed in the present study contribute to insights toward broadening the scope of research on strength-based masculinities. It is important to acknowledge the complex interplay between masculinities and men's health-related values that are fluid across age, context and cultures. This has important implications for how researchers theorise and understand masculinity as a means to inform and leverage gendered interventions to advance men's health.

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